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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/590,245 | TAKADA, JUN | |
| | Examiner | Art Unit | |
| | LI LIU | 2624 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 08 September 2010.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-8,22-25,38-41,46-54,74,75,84 and 85 is/are pending in the application.
 4a) Of the above claim(s) 22-25,38-41 and 46-49 is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-8,50-54,74,75,84 and 85 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____. | 6) <input type="checkbox"/> Other: _____ . |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 09/08/2010 has been entered.

Response to Amendment

2. The amendment to claims 1, 50, 74, 84, and 85 are acknowledged.

Claims 1-8, 22-25, 38-41, 46-54, 74, 75, 84 and 85 are pending. Claims 22-25, 38-41 and 46-49 are withdrawn from further consideration by the Examiner.

Claims 1-8, 50-54, 74, 75, 84, and 85 are under active consideration.

Response to Arguments/Remarks

3. Applicant's remarks filed on 09/08/2010 regarding the amendment to claims 1, 50, 74, 84, and 85 have been considered but are moot in view of the new grounds of rejection herein below, necessitated by the amendment.

It is noted that independent claims 4 and 75 have not been amended and there is no mention of these two claims in the remarks filed on 09/08/2010. The Examiner therefore assumes that the standing rejections of these claims are proper.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 74, 75, and 84 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claims 74, 75, and 84 are drawn to program embodied on a "computer-readable medium". However, the specification does not preclude transitory signals by way of explicit definition. Given the broadest reasonable interpretation consistent with the specification and state-of-the-art, the full scope of the claimed computer-readable medium covers both transitory and non-transitory media. Transitory media includes signals, carrier waves, etc. on which executable code was recorded and from which computers acquired such code. Transitory media do not fall within the definition of a process, machine, manufacture, or composition of matter (*In re Nuijten*), and are therefore non-statutory. The examiner suggests clarifying the claim to exclude such non-statutory signal embodiments, such as (but not limited to) by adding the modifier "non-transitory" to the claimed medium.

Claim Rejections - 35 USC § 112, second paragraph

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-3, 5, 7, 50-54, 74, 84, and 85 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites “**...extracting, as a signal block, signals of $2m \times 2m$... spatially adjacent elements ... from an LL subband of a same hierarchy of an image OR wavelet to perform two-dimensional Haar wavelet transform to the signal block**”. It is not clear what is meant by hierarchy of an image. In addition, the two-dimensional Haar wavelet transform should be performed on image pixel data, not on wavelet (coefficients) per se.

A similar rejection applies to claims 74 and 85.

Claim 1 recites “ **$2m \times 2m$ (m being an integer: $m=1$)**” in line 3. Since m is always 1, it is not clear how to interpret the limitation “**outputting m coefficient sets**” recited later in the claim. For examination purposes, it is assumed that m is an integer greater than or equal to 1.

Claim 50 recites “ **N hierarchies (N being an integer: $N=1$)**” in lines 6-7 , “ **n th hierarchy (n being an integer: $1=n=N$)**” in lines 11-12, and “ **m sets (m being an integer: $m=1$)**” in line 14. The claim then recites in lines 14-16 “**the $(n-1)$ th hierarchy**” which doesn’t make sense if $n=N=1$. In light of the specification (e.g., Fig. 1), N is the total number of decomposition level, and n is a number between 1 and N . For examination purposes, it is assumed that N , m , and n are integers greater than or equal to 1.

A similar rejection applies to claims 74, 84, and 85.

Claim 2 recites “**said predetermined signal scanning sequence**” in lines 1-2.

There is insufficient antecedent basis for this limitation in the claim.

Claims not mentioned specifically are dependent from indefinite antecedent claims.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-4, 50-52, 74, 75, 84, and 85 are rejected under 35 U.S.C. 102(b) as being anticipated by Sirohey et al. (hereafter referred to as ‘Sirohey’, US 2002/0057844).

Regarding claim 1, Sirohey discloses an encoding device comprising:
two-dimensional Haar wavelet transforming means (**pg. [0077], [0078], Haar wavelet with lifting**) for extracting, as a signal block (**Fig. 21A, block 418**), signals of $2m \times 2m$ (m being an integer: $m = 1$) spatially adjacent elements (**block 418 is 2x2 in dimension**) in a scan line order from an LL subband of a same hierarchy (**LL(1) is of the same hierarchy as HL(1), LH(1) and HH(1)**) of an image or wavelet to perform a two-dimensional Harr wavelet transform to the signal block (**Fig. 21A, wavelet transform is performed to image data 402, resulting in a 2x2 signal block 418, in a**

scan line order LL(1), HL(1), LH(1), and HH(1) as shown in 420, then a two-dimensional Harr wavelet transform is performed to the LL(1) subband to obtain the next level/hierarchy of decomposition 462);

coefficient extracting means for, whenever said two-dimensional Harr wavelet transforming means performs the two-dimensional Harr wavelet transform, extracting, as coefficient sets, LH, HL and HH coefficients belonging to same spatial coordinates (**Fig. 21A, blocks 426, 424, and 428 are the LH, HL, and HH coefficients that are arranged by (X, Y) coordinates, also see Fig. 23 and pg. [0109]-[0110]. It is to note that each cell in block 446 stores LH, HL and HH coefficients belonging to the same spatial coordinates. For example the leftmost cell (1, 3, 3) contains three coefficients: LH(1, 3, 3), HL(1, 3, 3), and HH(1, 3, 3). This is exactly the same as described in the instant application**) from coefficients obtained by the two-dimensional Haar wavelet transform, thereby outputting m coefficient sets (**blocks 426, 424, and 428 constitute the coefficient set for the decomposition level 1**);

coefficient encoding means for encoding the m coefficient sets to obtain codes (**Fig. 21A, block 446 contains codes from the three higher frequency subbands LH, HL, and HH of decomposition level 1**), and concatenating the codes in the scan line order in the same hierarchy to generate a code sequence of a high-frequency subband whenever the coefficient extracting means outputs the m coefficient sets (**Figs. 21A-B and pg. [0109]-[0110], numerals 446, 490, 532 show code sequence of concatenated AC component coefficient sets for levels 1, 2, 3, respectively**);

initial coefficient encoding means for encoding and concatenating a DC component as a lowest-frequency subband (**LL(n)**) to generate a code sequence of the lowest-frequency subband (**Figs. 21A-B and pg. [0109], numeral 562 in bottom-right of Fig. 21B is the lowest-frequency subband LL(n)**); and

code output means for outputting the code sequence of the lowest-frequency subband, and outputting, from a low-frequency hierachal order, the code sequence of the high-frequency subband generated by said coefficient encoding means (**Figs. 21A-B and pg. [0109]-[0110], data stream 404 comprises code sequence of the lowest-frequency subband LL(n), followed by HL(n), LH(n), HH(n), ... HL(1), LH(1), HH(1)**).

Regarding claim 2, Sirohey discloses an encoding device according to claim 1, wherein said predetermined signal scanning sequence represents a sequential order of scan lines of the two-dimensional signal, and said coefficient extracting means sequentially extracts a predetermined number of coefficient sets at a time in a scan line direction of the two-dimensional signal (**Fig. 21A and pg. [0109], the process 400 stores each spatially equivalent set of high-frequency sub-band blocks, resulting in the 16 data blocks 446 in a scan line direction (X, Y) = (0, 0) → (0, 1) → (0, 2) → (0, 3) → (1, 0) →**).

Regarding claim 3, Sirohey discloses an encoding device according to claim 1, characterized in that said coefficient extracting means sequentially extracts coefficient sets one by one (**Figs. 21A-B and pg. [0109]-[0110], e.g., numeral 446 indicates that**

spatially equivalent coefficient sets in decompose level 1 is extracted one by one following the order of (X, Y) = (0, 0) → (0, 1) → (0, 2) → (0, 3) → (1, 0) →).

Regarding claim 4, Sirohey discloses an encoding device characterized by comprising:

element extracting means for sequentially extracting $2m \times 2$ (m is an integer: $m \geq 1$) spatially adjacent elements from a two-dimensional signal (**pg. [0078]-[0081]**, the **S-Transform is used to decomposition of the image data**);

two-dimensional Haar wavelet transforming means for dividing the $2m \times 2$ elements into a plurality of subband coefficient sets (**pg. [0078]-[0081]**, the **S-Transform is Haar wavelet with lifting**);

coefficient encoding means for encoding and concatenating the AC-component coefficient sets obtained by transform by said two-dimensional Haar wavelet transforming means, and generating a code sequence of a high-frequency subband (**Figs. 21A-B, 22A-B, and pg. [0109]-[0110]**, the **tessellated high frequency subbands 424, 426 and 428 are identified by HL(n, X, Y), LH(n, X, Y), HH(n, X, Y), while the low frequency sub-band LL(n, X, Y) is passed for further wavelet decomposition. n denotes the decompose level: 1, 2,**);

initial coefficient encoding means for encoding and concatenating a DC component as a lowest-frequency subband (**LL(n)**), and generating the code sequence of the lowest-frequency subband (**Figs. 21A-B and pg. [0109], numeral 562 in Fig. 21B is the lowest-frequency subband LL(n)**); and

code output means for outputting the code sequence of the lowest-frequency subband, and sequentially outputting the code sequence of the high-frequency subband generated by said coefficient encoding means (**Figs. 21A-B and pg. [0109]-[0110], data stream 404 comprises code sequence of the lowest-frequency subband LL(n), followed by HL(n), LH(n), HH(n), ... HL(1), LH(1), HH(1).**)

Regarding device claims 50-52, they are the corresponding decoding device of claims 1-3. Sirohey discloses the decoding device that reverse the encoding procedure to get the original image (**Figs. 24A-B&25**).

Regarding encoding program claims 74 and 75, the limitations of the claims are rejected for the same reasons as set forth in the rejection of claims 1 and 4 above, respectively.

Regarding decoding program claim 84, which is the corresponding decoding program of claim 50. The limitations of the claim are rejected for the same reasons as set forth in the rejection of claim 50 above.

Regarding claim 85, which combines the limitations of the encoding device of claim 1 with the limitations of decoding device of claim 50, and is therefore rejected for the same reasons as set forth in the rejection of claims 1 and 50 above. Sirohey

discloses displaying a received image on the basis of the received image signal (Sirohey, Fig. 25).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 5-8, 53, and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sirohey (US 2002/0057844) as applied to claims 1 and 4 above respectively, and further in view of Okada et al. (hereafter referred to as 'Okada', US 7120306).

Regarding claims 5 and 6, Sirohey discloses an encoding device according to claims 1 and 4, respectively, but fails to disclose that each coefficient comprises a plurality of components, which is interpreted as color components such as RGB, YUV, etc.

Okada, in the same field of endeavor, discloses an image coding method wherein each coefficient comprises a plurality of components (**Okada, Fig. 3, components Y, C_b, and C_r**), and code is generated by concatenating a code of each component (Okada, Fig. 3, composition of the data stream).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Okada with that of Sirohey to yield the invention as described in claims 5 and 6, so that Sirohey's device can be used to code images with multiple components such as RGB or YUV. This modification could be made using known methods with no change to the operating principles of either reference to produce the predictable results of enabling desired regions of a color image individually handled for storage, transmission, retrieval, and display (Sirohey, abstract).

Regarding claims 7 and 8, Sirohey discloses an encoding device according to claims 1 and 4, respectively, but fails to disclose that each coefficient comprises a plurality of components, which is interpreted as color components such as RGB, YUV, etc.

Okada, in the same field of endeavor, discloses an image coding method wherein each coefficient comprises a plurality of components (**Okada, Fig. 3, components Y, C_b, and C_r**), and code is generated by concatenating a code of each coefficient (**Okada, Fig. 3, quantization and coding of coefficients of each component**).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Okada with that of Sirohey to yield the invention as described in claims 7 and 8, so that Sirohey's device can be used to code images with multiple components such as RGB or YUV. This modification could be made using known methods with no change to the operating principles of either reference to

produce the predictable results of enabling desired regions of a color image individually handled for storage, transmission, retrieval, and display (Sirohey, abstract).

Device claims 53 and 54 are the corresponding decoding devices of claims 5 and 6, respectively. It would have been obvious to one having ordinary skill in the art at the time the invention was made to reverse the encoding procedure to get the original image. A mere reversal of the coding process is held involving only routine skill in the art.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Chui; Charles K. et al. (US 6549674 B1): image compression based on tiled wavelet-like transform using edge and non-edge filters.

Miller; Michael E. et al. (US 6985158 B2): method and system for displaying an image.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LI LIU whose telephone number is (571)270-5363. The examiner can normally be reached on Monday- Friday, 8:00AM-4:30PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samir Ahmed, can be reached on (571)272-7413. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/LI LIU/
Examiner, Art Unit 2624